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ORIGINAL ARTICLE

The genus *Glaucopterum* Wagner (Hemiptera: Miridae: Phylinae) from China, with description of two new species

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Abstract Three species of mirid genus *Glaucopterum* from China are presented of which *Glaucopterum nitrarium* **sp. nov.** and *G. shanxiense* **sp. nov.** are described as new. A key to Chinese species is offered. Photographs of the dorsal habitus and illustrations of the genitalia are provided. All type specimens are deposited in Institute of Entomology, Nankai University, Tianjin, China.

Key words Hemiptera, Miridae, Phylinae, *Glaucopterum*, new species, China.

1 Introduction

The genus *Glaucopterum* was erected by Wagner (1963) to accommodate the type species *G. kareli* Wagner, 1963. Subsequently, all works, dealing with *Glaucopterum*, were appeared in the Palearctic.

Putshkov (1975, 1977, 1979) described *Glaucopterum* with five species from USSR. Kerzhner (1984) illustrated his nine new species from Uzbekistan and Mongolia. Carapezza's work (1997) focused on Africa, he described two species from Tunisia. Linnavuori (1998) described one species from Iran. Recently, Konstantinov (2006) described one species from Kazakhstan. Four species were moved from the other genera into *Glaucopterum* genus (Linnavuori, 1986; Carapezza, 1997; Kerzhner, 1997). Currently, 23 species of genus *Glaucopterun* are recorded in the world (Schuh, 2013).

In China, only one species of the genus *Glaucopterum* was reported. In the present paper, three species are presented, including two new species, *G. nitrarium* **sp. nov.** and *G.. shanxinese* **sp. nov.** The key to Chinese species is offered. Digital habitus photographs and illustrations of the male genitalia are given.

2 Materials and methods

All genitalic illustrations were made from temporary slide mounts in lactophenol, using an Olympus SZ-ST microscope. Dorsal view photographs were made with a Nikon SMZ1000 apparatus. See table 1 for measurements and all measurements are in millimeters (mm). The type and other specimens examined in this study are deposited in the Institute of Entomology, College of Life Sciences, Nankai University, Tianjin, China.

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3 Taxonomy

***Glaucopterum* Wagner, 1963**

Type species: *Glaucopterum kareli* Wagner, 1963.

Glaucopterum Wagner, 1963: 8; Wagner, 1975: 373; Putshkov, 1975: 1037, 1977: 373; Kerzhner, 1984: 41, 1997: 246; Schuh, 1995: 320.

Diagnosis. Moderate size, macropterous, elongate oval or ovate; general coloration varying from almost completely pale to dark brown, some species with dark speckles on dorsum (as in *G. majus* and *G. zygophylli*); surface distributed silvery or brown, reclining and weakly widen setae; head declivitous, width longer than high; posterior margin of vertex straight; antennae not sexually dimorphic; labium not exceeding abdomen; tibial spines pale without clear dark spots at bases; length of tarsal segment II almost equal to that of segment III, tarsal segment I short; claws relatively large, slightly curving, pulvilli small, adnate to basal half of ventral claw surface at least; parempodia setiform. Male genitalia: vesica S-shaped or L-shaped, well sclerotized, with one or two apical spines; left paramere boat-shaped; right paramere lanceolate or truncate apically; phallotheca more or less curving, attenuated apically.

Host plants. *Atraphaxis* spp. (Josifor, 1993); *Elaeagnus* spp., *Lyceum* spp., *Nitratia* spp., *Zygophyllum* spp. (Kerzhner, 1984).

Remarks. Some species of *Glaucopterum* (as in *G. atraphaxius*) are similar to *Europiella* spp. in the shape of right paramere, their right parameres truncate apically. But *Europiella* spp. is smaller in size and have tibial spines dark with clear dark spots at bases. Easily confused with species of *Eurycolpus* in coloration, but lateral margins of pronotum always concave in *Eurycolpus*.

Table 1. Measurements of the Chinese species of genus *Glaucopterum*.

Species	Range	Body length	Head width	Interocular distance	Eye width	AntSeg2 length	Pronotum length	Pronotum width
G. gobicum								
Male (*n* = 9)	Min	3.23	0.78	0.32	0.21	0.82	0.43	1.10
	Max	3.27	0.81	0.33	0.23	0.87	0.46	1.16
Female (*n* = 10)	Min	3.54	0.79	0.34	0.17	0.96	0.48	1.18
	Max	3.66	0.84	0.36	0.19	1.00	0.51	1.23
G. nitrarium **sp. nov.**								
Male (*n* = 4)	Min	3.19	0.76	0.32	0.21	0.92	0.42	1.11
	Max	3.22	0.79	0.34	0.22	0.94	0.45	1.13
Female (*n* = 6)	Min	3.23	0.77	0.35	0.19	0.93	0.48	1.17
	Max	3.24	0.79	0.36	0.21	0.96	0.50	1.19
G. shanxiense **sp. nov.**								
Male (*n* = 4)	Min	3.53	0.64	0.31	0.18	0.96	0.47	1.16
	Max	3.57	0.69	0.34	0.19	0.99	0.48	1.19
Female (*n* = 8)	Min	3.44	0.70	0.35	0.15	0.93	0.47	1.14
	Max	3.50	0.73	0.38	0.17	0.97	0.49	1.21

Key to the Chinese species of the genus *Glaucopterum*

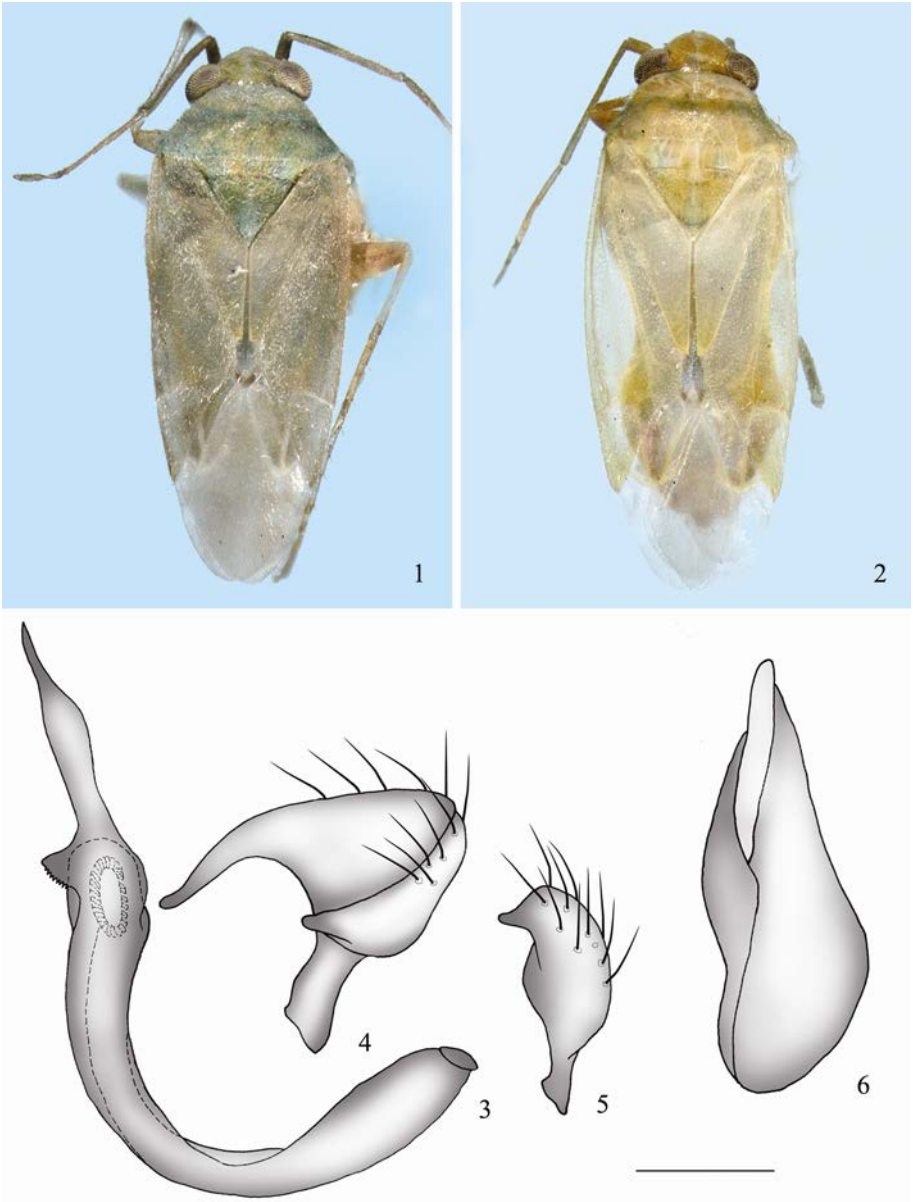
1. General coloration yellowish brown (Figs 13–14), total length of antennal segments III and IV shorter than segment II..... .....***G. shanxiense* sp. nov.**
   General coloration yellow or weakly greenish (Figs 1–2, 7–8), total length of antennal segments III and IV longer than segment II 2
2. Vesica sigmoid with two acuate apical spines (Fig. 9) .....***G. nitrarium* sp. nov.**
   Vesica L-shaped with one acuate apical spine (Fig. 3) .....***G. gobicum***

3.1 *Glaucopterum gobicum* Kerzhner, 1984 (Figs 1–6)

Glaucopterum gobicum Kerzhner, 1984: 53; Zhao, 1996; Schuh, 1995: 320.

Specimens examined. 9♂, 16♀, Gantang (37°29'N, 104°31'E), Ningxia, China, 27 June 1993, leg. Rui-Jun Zhao and Guo-Qing Liu.

Body medium, oval, dorsum yellowish green without spot; vestiture with pale simple setae; head declining, clypeus not visible from above; vertex flat in lateral view, posterior margin straight; interocular distance longer than width of eye; eyes almost occupying entire height of head in lateral view; antennae inserted above ventral margin of eyes, antennal segments III and IV slender than segment II, total length longer than segment II; labium pale, infuscate apically, reaching to posterior margin of mesocoxa; pronotum slightly forward, surface smooth, yellow, lateral and posterior margins nearly straight, callus weakly convex; legs brown yellow, femora with unclear spots; tibial spines light brown without dark spots at bases; ventral of body greenish yellow with golden yellow hairs.



Figs 1–6. *Glaucopterum gobicum* Kerzhner. 1–2. Habitus, dorsal view. 1. Male. 2. Female. 3–6. Male genitalia. 3. Vesica. 4. Left paramere. 5. Right paramere. 6. Phallotheca. Scale bar: 3–6 = 0.2 mm.

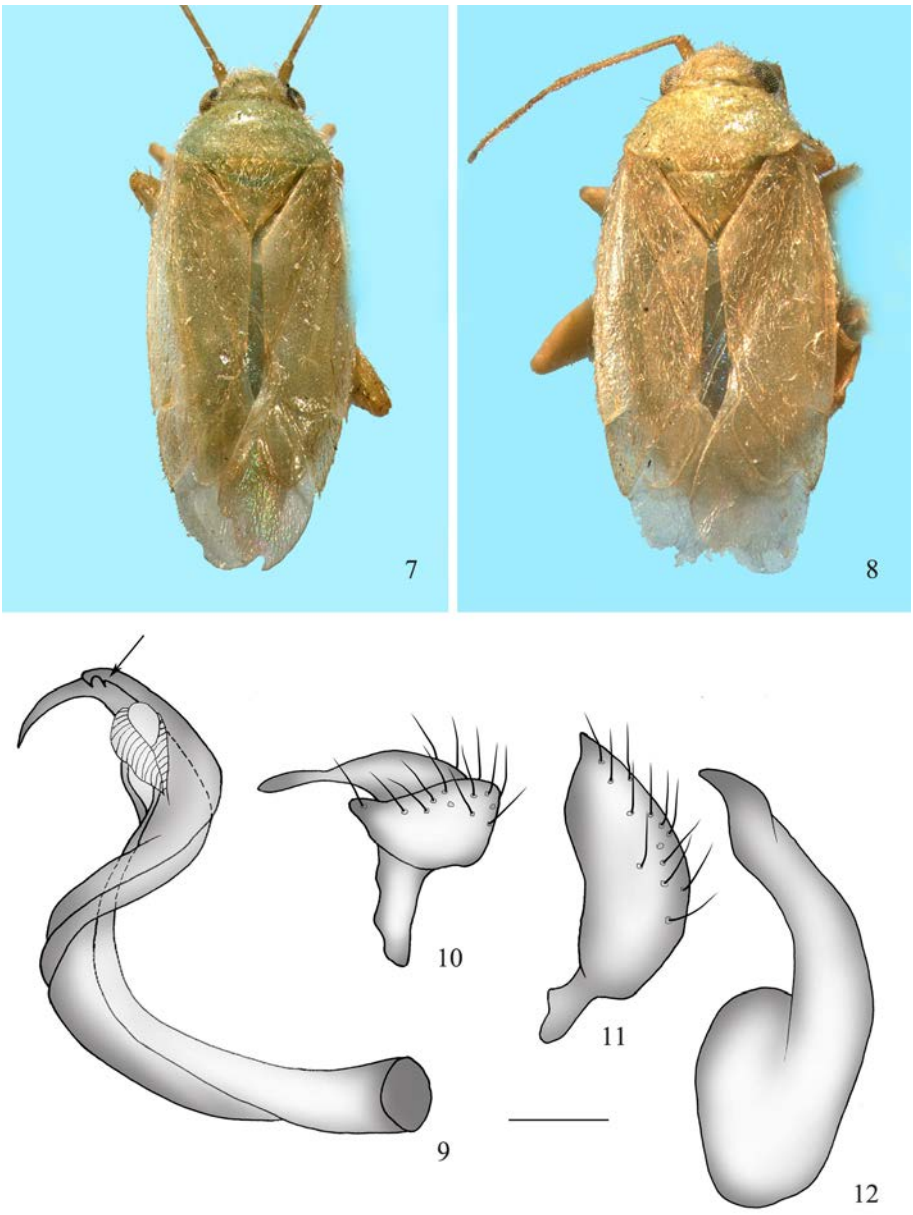
Male genitalia (Figs 3–6). Vesica L-shaped with a rather long attenuated apical spine; left paramere with long setae on dorsal surface; right paramere decurved apically; phallotheca not strongly angled.

Host plant. *Nitraria sphaerocarpa*, Maxim. (Zygophyllaceae) (Kerzhner, 1984).

Distribution. China (Ningxia); Mongolia.

3.2 *Glaucopterum nitrarium* sp. nov. (Figs 7–12)

Holotype ♂, Yanchi (37°47'N, 107°25'E), Ningxia, China, 21 July 1992, leg. Guo-Qing Liu. Paratypes: 1♂, 3♀, same data as holotype; 1♂, 2♀, same locality as holotype, 21 July 1992, leg. Rui-Jun Zhao; 1♂, 1♀, Otog Qianqi (38°11'N, 107°26'E), Inner Mongolia, China, 21 July 1992, leg. Guo-Qing Liu.



Figs 7–12. *Glaucopterum nitrarium* **sp. nov.** 7–8. Habitus, dorsal view. 7. Male. 8. Female. 9–12. Male genitalia. 9. Vesica. 10. Left paramere. 11. Right paramere. 12. Phallotheca. Scale bar: 9–12 = 0.2 mm.

Male (Fig. 7). Body elongate oval. Female (Fig. 8). Coloration and vestiture as in males, but body form more ovoid.

Coloration. General coloration pale yellow and weakly greenish, dorsum without any dark marking, covered with golden, shining setae; antenna yellow, segment IV often weakly darkened; eyes blackish brown; labium infuscate at apex; membrane pale, hyaline, without dark spots; legs yellow, tibial spines yellow without spots at bases; abdomen greenish, genital capsule yellow.

Structure. Dorsum shining and smooth; clypeus at most barely visible from above; frons and vertex slightly convex; eyes granular, occupying nearly total side of head in lateral view, eye width smaller than interocular distance; antennal segment II longer than width of head, segments III and IV more slender than segment II, total length of segments III and IV longer than segment II; labium reaching mesocoxa; pronotum evenly convex, calli not demarcated, posterior margin weakly concave across moderately exposed mesoscutum; scutellum very weakly convex; hemelytra weakly deflexed at fracture, always macropterous, apex of abdomen reaching about posterior margin of membrane cells, corial margin very weakly convex in males, distinctly convex in females; genital capsule large in males, occupying about half of length of abdomen.

Male genitalia (Figs 9–12). Vesica sigmoid with two apical spines, anterior apical spine acuate, longer than posterior, posterior apical spine hooked with a tooth near the apex, secondary gonopore subapical, developed, with one sclerotized stick below it; left paramere boat-shaped; right paramere lanceolate; phallotheca with a project near apex.

Host plant. *Nitraria* spp.

Etymology. The name of this species refers to its host plant *Nitraria* spp.

Remarks. The species is most confused with *G. gobicum* on the basis of size and coloration, but easily separated by the structure of the male genitalia. It is also similar to *G. muminovi* in the shape of vesica (the posterior apical spine with a tooth near apex), but the latter has general coloration blackish brown, much darker than *G. nitrarium* **sp. nov.**, and right paramere relatively truncate apically.

3.3 *Glaucopterum shanxiense* sp. nov. (Figs 13–18)

Holotype ♂, Changcheng Mountain (40°38'N, 113°72'E), Shanxi, China, 27 May 1987. Paratypes: 3♂, 8♀, same data as holotype.

Male (Fig. 7). Macropterous, elongate oval, relatively stout-bodied, moderately large. Female (Fig. 8). Very similar to males, but body slightly more ovoid than males.

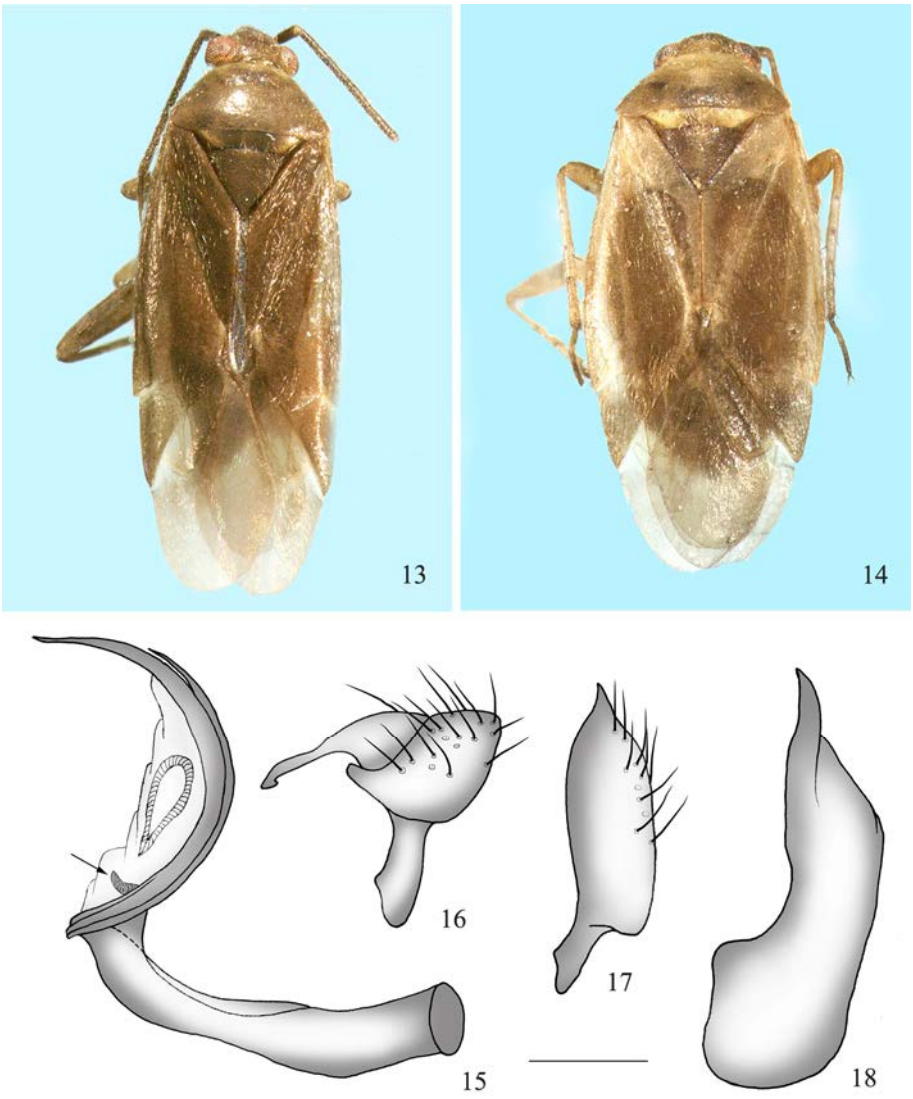
Coloration. Body brown; vestiture with dense, golden, and shining setae; antenna almost entirely dark brown; eyes brown; labium infuscate, darkened apically; membrane smoky, veins slightly darkened; abdomen brown; femora infuscate with not clear spots; tibial spines light brown without clear spots at bases; apices of tarsi and claws darkened; venter greenish yellow with gold yellow hair.

Structure. Head almost vertical, clypeus not visible from above; frons and vertex weakly rounded and smooth in dorsal view; posterior margin of vertex straight; eyes occupying almost entire side of head, posterior margin contiguous with anterior margin of pronotum; antennal segment II much longer than width of head, segments III and IV slender than segment II and total length shorter than segment II; labium reaching mesocoxa; pronotum evenly rounded, lateral and posterior margins nearly straight, calli not clear; hemelytra smooth, nearly parallel-sided in males, weakly deflexed at fracture, membrane developed; genital capsule curving in males, large.

Male genitalia (Figs 15–18). Vesica twisted, sigmoid, with two apical spines, posterior apical spine relatively short, secondary gonopore oval, vesica with a small curved sclerotized rod in middle; left paramere boat-shaped; right paramere lanceolate; phallotheca weakly curving, attenuated apically.

Etymology. This species is named for the type material locality (Shanxi).

Remarks. The species is most similar to *G. polii* in size and coloration of dorsum, but distinguished by the structure of vesica and the coloration of femora. It is also similar to *G. atraphaxius* by their vesicae all S-shaped and with two apical spines, but *G. atraphaxius* has the vesica more curve and without a small curved sclerotized rod in middle. In addition, the new species can be easily distinguished from *G. atraphaxius* by the darker ground coloration.



Figs 13–18. *Glaucopterum shanxiense* **sp. nov.** 13–14. Habitus, dorsal view. 13. Male. 14. Female. 15–18. Male genitalia. 15. Vesica. 16. Left paramere. 17. Right paramere. 18. Phallotheca. Scale bar: 15–18 = 0.2 mm.

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